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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,797	05/26/2006	Alain Guillard	Serie 6423	7256
Linda K Sussell Air Liquide Intellectual Property Department 2700 Post Oak Blvd Ste 1800 Houston, TX 77056			EXAMINER HAMO, PATRICK	
			ART UNIT 3746	PAPER NUMBER
			MAIL DATE 12/03/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/580,797

Applicant(s)

GUILLARD ET AL.

Examiner

PATRICK HAMO

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-21 is/are rejected.
- 7) ☒ Claim(s) 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 August 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/GS/US)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

This action is in response to amendments filed on August 11, 2009.

Drawings

The drawings were received on August 11, 2009. These drawings are accepted.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13-19 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Barchas et al., US 5,082,481.

In regard to claims 13-15:

Barchas discloses a gas compression system comprising 5 stages (12, 18, 24, 30, 36), each stage followed by a cooler system (14, 20, 26, 32, 48/50/52), the pressure drop through the last, furthest downstream cooler system (a set of three coolers) being greater than the pressure drops in the first sets of coolers. The pressure of the gas leaving the first compressor stage 12 is between 25 and 40 psig, such that the pressure drop through the first cooler can be no greater than about 50 psi. On the other hand,

the outlet pressure of final compressor stage 36 is 450-650 psig, and the cooler system 48/50/52 reduces the temperature to between 80 and 120 degrees F and supplies the compressed fluid to a knockout drum, in which, by definition, both liquid and vapor forms of the fluid exist. In Barchas, the fluid is a heavy hydrocarbon. To have the heavy hydrocarbon in such a state requires a pressure drop greater than 50 psi from the outlet pressure of the compressor, hence the need for three coolers to achieve the temperature and pressure drop. Therefore, the pressure drop in the final set of coolers of Barchas is greater than the pressure drop through the first cooler.

In regard to claims 16 and 17:

The final stage compressor, downstream from all other compressors, has a higher pressure drop due to the multiple coolers coming after the compression stage. In fact, with two coolers identical to each individual cooler in the prior stages, the pressure drop is 100% larger at this stage.

In regard to claim 18:

Barchas discloses that the unit is for separating a gas mixture (H_2) from a cracking effluent (Abstract).

In regard to claim 19:

Barchas discloses a cryogenic distillation unit comprising at least one distillation column 60 (col. 6, ll. 5-29), means for sending compressed gas to a column of the unit

(via lines 59), means for withdrawing a liquid from a column of the unit (line 61), means for vaporizing the liquid by heat exchange with a compressed gas (where lines 45 and 61 meet), the compressed gas having been compressed by the final stage of the compressor.

In regard to claim 21:

Barchas discloses a method of separating a gas using cryogenic distillation whereby the gas is compressed in the compressor to a pressure of 550-650 psi at the final stage of the compressor.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Barchas in view of Wong et al., US 6,685,903.

Barchas discloses all of the limitations substantially as claimed except for the following taught by Wong: a heat exchanger 114 for vaporizing the liquid coming from distillation column 120 using the gas coming from the second stage compressor 122. It would have been obvious to one of ordinary skill in the art at the time of the invention to

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have modified the distillation column of Barchas with the heat exchanger system of Wong to cool the discharge liquid from the distillation column.

Allowable Subject Matter

Claim 22 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed August 11, 2009 have been fully considered but they are not persuasive. The arguments are addressed in the rejection under 102(b) above, namely that the pressure drop in the final set of coolers must be greater than that of the first cooler in order for the knockout drum of Barchas to function properly.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK HAMO whose telephone number is (571)272-3492. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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